

AMENDMENTS TO THE CLAIMS

Following is a current listing of all pending claims, including amendments made herein. Support for the changes is discussed in the Remarks.

1. *(currently amended)* In a series of seismic data processing steps to produce a seismic image of a subsurface region from ~~A method for use in seismic data processing to control the wavelet phase spectrum of~~ seismic data collected using a seismic source with a known signature wavelet ~~and at least one receiver, wherein at least one processing step assumes a particular phase property for input data, a phase control~~ said method comprising the steps of:

(a) using the source signature to design a first phase-control filter to limit wavelet phase spectrum consistent with said phase assumption or ~~assumptions inherent in at least one subsequent processing step, having first processed the source signature with any processing steps previously applied to the seismic data;~~

(b) applying the first phase-control filter to the seismic data before said subsequent at least one processing step[[s]]; and
wherein before use in (a), the source signature is first processed with any processing steps applied to the seismic data before said first phase-control filter is applied in (b);

(c) after applying the first phase-control filter in (b), performing all subsequent processing steps on the phase-controlled seismic data, thereby transforming the seismic data into a version more representative of the subsurface region; and

(d) imaging physical structure of the subsurface region using the transformed seismic data.

2. *(original)* The method of claim 1, wherein the first phase-control filter shapes the source signature to minimum phase.

3. *(currently amended)* The method of claim 1, wherein said series of seismic data processing steps ~~subsequent processing~~ concludes with a second phase-control filtering of the seismic data, ~~said second phase control filter being designed in steps comprising applying the first phase control filter to the source signature from which it was designed, then processing the filtered source signature with said all subsequent~~

~~processing steps up to the second phase-control filtering, and then using the resulting source signature to design a second phase-control filter to limit wavelet phase consistent with post-processing needs.~~

4. *(original)* The method of claim 3, wherein the second phase-control filter shapes the source signature to zero phase.

5. *(currently amended)* The method of claim 1, wherein said at least one ~~subsequent~~ processing step that assumes a particular phase property comprises ~~the steps of~~ receiver-consistent deconvolution and predictive deconvolution.

6. *(new)* The method of claim 3, wherein said second phase-control filter is designed by a method comprising applying the first phase-control filter to the source signature from which it was designed, then processing the filtered source signature with said all subsequent processing steps except the final step where the second phase-control filter will be applied, and then using the resulting source signature to design a second phase-control filter to limit wavelet phase consistent with post-processing needs.

CONCLUSION

The applicants believe that the foregoing arguments address all rejections in the office action, and respectfully request reconsideration of the application and allowance of all pending claims.

The Commissioner is authorized to charge any additional fees which may be required, to Account No. 05-1328.

Respectfully submitted,

Date: 14 May 2009

/J. Paul Plummer/
J. Paul Plummer
Reg. No. 40,775

ExxonMobil Upstream Research Company
CORP-URC-SW359
P.O. Box 2189
Houston, Texas 77252-2189
Telephone: (713) 431-7360
Facsimile: (713) 431-4664